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Unbiased quantification of jet energy loss

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Bin migration effects hinder a direct connection between the nuclear modification factor R_{AA} and the energy lost by jets. R_{AA} compares yields of jets, in pp and AA collisions, that are reconstructed with the same p_T and is thus biased by the steeply falling jet spectrum. To mitigate these effects, Brewer et al. [1] introduced a novel observable to directly quantify average jet energy loss (Q_{AA}), given by the ratio of the transverse momenta that correspond to the same probability quantiles in pp and AA.

This work reinforces the claim that Q_{AA} ratio is a reliable proxy for jet energy loss and, by using it, it shows that energy loss decreases with increasing jet radius when QGP response, as implemented in the JEWEL event generator, is accounted for. Further, our results establish that, contrary to recent claims, the difference in R_{AA} between dijet and boson-jet events is dominated by differences in the spectral shape, leaving the colour charge of the jet initiating parton with a minor role to play.

[1] Brewer, J., Milhano, J. G., & Thaler, J. (2019). Sorting out quenched jets. *Physical Review Letters*, 122(22), 222301.

Experiment/Theory

Theory/Phenomenology

Affiliation

LIP - Lisbon

Primary authors: Herr M. SILVA, João (LIP - Lisboa / ULisboa - IST); APOLINÁRIO, Liliana (LIP); Prof. MILHANO, Jose Guilherme (Universidade de Lisboa); LUÍS, Lénea (LIP - Lisboa)

Vortragende(r): Herr M. SILVA, João (LIP - Lisboa / ULisboa - IST)

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